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REMARKS

In the Final Office Action, the Examiner noted that claims 1, 2, 6-10, 13-16, 18, and 23-27 stand rejected. By this response, claims 1 and 9 are amended, claims 23-27 are canceled, claims 2, 6-8, 10, 13-16, and 18 continue unamended, and new dependent claims 28-34 are added.

It is to be understood that the applicants, by amending the claims, do not acquiesce to the Examiner's characterizations of the art of record or to applicants' subject matter recited in the pending claims. Further, applicants are not acquiescing to the Examiner's statements as to the applicability of the prior art of record to the pending claims by filing the instant responsive amendments.

In view of the following discussion, the applicants submit that none of the claims now pending in the application are obvious under the provisions of 35 U.S.C. §103. Thus, the applicants believe that all of these claims are now in allowable form.

REJECTIONS

35 U.S.C. §103

A. Claims 1, 2, 6-10, 13 and 14

The Examiner has rejected claims 1, 2, 6-10, 13 and 14 under 35 U.S.C. §103(a) as being unpatentable over Asamizuya et al. (U.S. Patent No. 6,314,576, issued November 6, 2002, hereinafter "Asamizuya") in view of Liu et al. (U.S. Patent No. 5,970,233, issued October 19, 1999, hereinafter "Liu") and Russo et al. (U.S. Patent No. 5,701,383, issued December 23, 1997, hereinafter "Russo") in view of PCT WO 96/13121 to McLaren (hereinafter "McLaren"). The applicants respectfully traverse the rejection.

Applicants' claim 1 (and similarly claim 9), as amended, recites:

"Apparatus for providing demand television comprising:
a broadcast encoder for receiving and encoding a real-time video frame sequence to form a broadcast bitstream;
a storage encoder for receiving and encoding the real-time video frame sequence to form a plurality of storage bitstreams, wherein said storage encoder comprises:

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a first encoder for producing a play bitstream that contains information that, when decoded, produces a forward play video frame sequence, said first encoder receiving and encoding the real-time video frame sequence contemporaneously with said broadcast encoder receiving and encoding said real-time video frame sequence;

a frame subsampler for receiving and subsampling the real-time video frame sequence contemporaneously with said broadcast encoder and first encoder receiving and encoding said real-time video frame sequence;

a buffer, for storing subsampled frames of the real-time video frame sequence;

a second encoder for producing a fast forward bitstream that contains information that, when decoded, produces a fast-forward video frame sequence;

a third encoder for producing a fast-reverse bitstream that contains information that, when decoded, produces a fast-reverse video frame sequence; and

a controller that selects subsampled frames from the buffer and couples selected frames to the second and third encoders." (emphasis added).

The test under 35 U.S.C. §103 is not whether an improvement or a use set forth in a patent would have been obvious or non-obvious; rather the test is whether the claimed invention, considered as a whole, would have been obvious. Jones v. Hardy, 110 U.S.P.Q. 1021, 1024 (Fed. Cir. 1984) (emphasis added). The applicants submit that none of the references, either singularly or in combination, teach or suggest the applicants' invention as a whole, since the combined references fail to teach or suggest that the broadcast encoder, first encoder and frame subsampler contemporaneously receive the real-time video frame sequence and then contemporaneously encode and subsample the real-time video frame sequence, respectively.

In particular, the Asamizuya reference discloses that a near video-on-demand (NVOD) compilation unit edits and compresses film stock such as video film or video stock recorded on video tape, stores them for a long period, and transmits required video information to the near video-on-demand playout unit in accordance with the broadcast. The encoder compresses and encodes the video signals and audio signals for the film stock or the VTR stock input via the switching circuit based on the MPEG-2 standard. Accordingly, the signal after the encoder is a digital AV signal compressed and encoded by the MPEG-2 standard. The communication controller fetches a

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corresponding program stored in the archive storage 116 according to a request from the broadcast side and instruction from the NVOD playout unit, that is, the compilation system controller receiving an instruction for supply at the program supply side, and transmits the same via the communication path to the NVOD playout unit (see, Asamizuya, col. 8, lines 51-56, col. 9, lines 3-19, and col. 10, lines 41-48). As the Examiner concedes, nowhere in the Asamizuya reference is there any teaching or suggestion of the broadcast encoder, and transmitting the bitstream contemporaneous to storing the bitstream.

Furthermore, the Liu reference fails to breach a substantial gap as between the Asamizuya reference and the applicants' invention. In particular, the Liu reference discloses that during encoding, host processor 116 reads the captured bitmaps from memory device 112 via high-speed memory interface 110 and generates an encoded video bitstream that represents the captured video data. Depending upon the particular encoding scheme implemented, host processor 116 applies a sequence of compression steps to reduce the amount of data used to represent the information in the video images. Many video compression schemes divide images into blocks of pixels for compression purposes. The resulting encoded video bitstream is then stored to memory device 112 via memory interface 110. Host processor 116 may copy the encoded video bitstream to mass storage device 120 for future playback and/or transmit the encoded video bitstream to transmit 118 for real-time transmission to a remote receiver (not shown in FIG. 1).

Nowhere in the Liu reference is there any teaching or suggestion of "a first encoder for producing a play bitstream that contains information that, when decoded, produces a forward play video frame sequence, said first encoder receiving and encoding the real-time video frame sequence contemporaneously with said broadcast encoder receiving and encoding said real-time video frame sequence, and a frame subsampler for receiving and subsampling the real-time video frame sequence contemporaneously with said broadcast encoder and first encoder receiving and encoding said real-time video frame sequence." Rather, the Liu reference teaches that once the video bitstream is encoded, it is first stored in a first memory device (e.g.,

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RAM), and then may copied to a mass storage device and/or transmitted to a transmitter.

Furthermore, the Liu reference is completely silent with respect to "a frame subsampler for receiving and subsampling the real-time video frame sequence contemporaneously with said broadcast encoder and first encoder receiving and encoding said real-time video frame sequence." In other words, the combination of Asamizuya and Liu fail to teach or suggest that the broadcast encoder, first encoder, and subsampler contemporaneously receive the real-time video frame sequence. Moreover, the two references fail to teach or suggest that the broadcast and first encoder contemporaneously encode the real-time video frame sequence, while the subsampler subsamples the real-time video frame sequence.

Further, the Russo and McLaren references fail to bridge a substantial gap as between the Asamizuya and the Liu reference with respect to the applicants' invention. In particular, the Russo reference discloses "if a time-shifted version of the program is being output for any reason, a FAST FORWARD command may be entered, in which case playback is speeded up until deactivation of the command, at which time normal playback resumes, resulting in the output of the program exhibiting a reduced time shift, including a zero time shift in the event the operator "catches up" with the incoming program as it is being received (see, Russo, col. 3, lines 31-38). However, nowhere in the Russo reference is there any teaching or suggestion of "wherein the storage device stores the storage bitstream contemporaneous to the transmission system transmitting the broadcast bitstream."

Still further, the McLaren reference teaches a first encoder for encoding original HDTV video information, and a plurality of secondary encoders for respectively encoding subsampled video signals at various rates (see, McLaren, FIG. 4). Even if the Asamizuya, Liu, Russo and McLaren references could be somehow operably combined, the references would merely disclose the encoding of video frame sequence to form a storage bitstream, which is then stored in a memory device, copying and/or transmitting the stored encoded video bitstream respectively to another storage device or to a transmitter and switching between trick play and normal playback. However, nowhere in the four references is there any teaching or suggestion of "a first encoder for

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producing a play bitstream that contains information that, when decoded, produces a forward play video frame sequence, said first encoder receiving and encoding the real-time video frame sequence contemporaneously with said broadcast encoder receiving and encoding said real-time video frame sequence, and a frame subsampler for receiving and subsampling the real-time video frame sequence contemporaneously with said broadcast encoder and first encoder receiving and encoding said real-time video frame sequence." Therefore, the combined references fail to teach or suggest the applicants' invention as a whole.

The references must be taken in their entireties, including those portions which argue against obviousness. Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 230 U.S.P.Q. 416, 420 Fed. Cir. 1986). It is impermissible within the framework of the 35 U.S.C. § 103 to pick and choose from a reference only so much of it as will support a conclusion of obviousness to the exclusion of other parts necessary to a full appreciation of what the reference fairly suggests to one skilled in the art. Id. at 419. Moreover, the invention as a whole is not restricted to the specific subject matter claimed, but also embraces its properties and the problem it solves. In re Wright, 6 USPQ 2d 1959, 1961 (Fed. Cir. 1988) (emphasis added).

In this instance, the applicants have solved the problem of providing, in a VOD system, near real-time availability of fast forward and fast reverse functions and real-time availability of high bit rate video bitstream that, when decoded, produces a play sequence. The applicants have solved this problem by implementing a broadcast encoder to encode real-time video frame sequence to form a broadcast bitstream, and "a first encoder for producing a play bitstream that contains information that, when decoded, produces a forward play video frame sequence, said first encoder receiving and encoding the real-time video frame sequence contemporaneously with said broadcast encoder receiving and encoding said real-time video frame sequence, and a frame subsampler for receiving and subsampling the real-time video frame sequence contemporaneously with said broadcast encoder and first encoder receiving and encoding said real-time video frame sequence."

The mere fact that a prior art structure could be modified to produce the claimed invention would not have made the modification obvious unless the prior art suggested

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the desirability of the modification. *In re Fritch*, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992); *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). In this instance, there is no teaching or suggestion of contemporaneously performing two distinct encoding operations and a subsampling operation on the received real-time video frame sequence by the broadcast encoder, first encoder, and subsampler, respectively. Therefore, the combined references fail to teach or suggest the applicants' invention as a whole.

As such, the Applicants submit that independent claim 1 (and similarly independent claim 9) is not obvious and fully satisfies the requirements of 35 U.S.C. §103 and is patentable thereunder. Furthermore, claims 2 and 6-8 and 10, 13, 14 and new claims 28-33, respectively, depend from independent claims 1 and 9 and recite additional features thereof. As such, and at least for the same reasons as discussed above, the Applicants submit that these dependent claims are also not obvious and fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder. Therefore, the Applicants respectfully request that the rejections be withdrawn.

B. Claims 16 and 18

The Examiner has rejected claims 16 and 18 under 35 U.S.C. §103(a) as being unpatentable over Asamizuya, Liu, and Russo in view of Lee (U.S. Patent No. 5,771,335, issued June 23, 1998, hereinafter "Lee"). The applicants respectfully traverse the rejection.

Claims 16 and 18 depend from independent claim 9 and recite additional features thereof. For example, dependent claim 16, when combined with the base claim 9, recites in part:

"A method for providing demand television comprising the steps of:
encoding, in real-time, a broadcast video frame sequence to form a broadcast bitstream, while contemporaneously encoding the broadcast video frame sequence to form a plurality of storage bitstreams, wherein said plurality of storage bitstreams are contemporaneously formed by the steps of:

encoding said frames to form a play bitstream contemporaneously with said encoding, in real-time, said broadcast video frame sequence to form said broadcast bitstream;

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subsampling said broadcast video frames contemporaneously with respect to said encoding said frames to form said broadcast bitstream and said play bitstream;

buffering said subsampled frames;
recalling said buffered frames in a forward time sequence order;
encoding said recalled buffered frames to form a fast forward
bitstream;

recalling said buffered frames in a reverse time sequence order;
and

encoding said recalled buffered frames to form a fast
reverse bitstream." (emphasis added).

As discussed above, the combination of Asamizuya, Liu, and Russo merely discloses the encoding of video frame sequence to form a storage bitstream, which is then stored in a memory device, copying and/or transmitting the stored encoded video bitstream respectively to another storage device or to a transmitter and switching between trick play and normal playback. However, nowhere in these three references is there any teaching or suggestion of "encoding said frames to form a play bitstream contemporaneously with said encoding, in real-time, said broadcast video frame sequence to form said broadcast bitstream, and subsampling said broadcast video frames contemporaneously with respect to said encoding said frames to form said broadcast bitstream and said play bitstream." Therefore, the Asamizuya, Liu, and Russo references fail to teach or suggest the applicants' invention as a whole.

Furthermore, the Lee reference fails to bridge the substantial gap as between the Asamizuya, Liu, and Russo references and the applicants' invention. In particular, the Lee reference discloses fast forward and reverse functions in a VOD system (see, Lee, Abstract). Even if the four references could be somehow operably combined, the references would merely disclose the encoding of video frame sequence to form a storage bitstream, which is then stored in a memory device, copying and/or transmitting the stored encoded video bitstream respectively to another storage device or to a transmitter, and switching between trick play (fast forward and rewind features) and normal playback. However, nowhere in the four references is there any teaching or suggestion of "encoding said frames to form a play bitstream contemporaneously with said encoding, in real-time, said broadcast video frame sequence to form said broadcast bitstream, and subsampling said broadcast video frames contemporaneously

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with respect to said encoding said frames to form said broadcast bitstream and said play bitstream." Therefore, the four references fail to teach or suggest the applicants' invention as a whole.

As such, the applicants submit that claims 16 and 18 are not obvious and fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder. Therefore, the applicants respectfully request that the rejection of claims 16 and 18 be withdrawn.

D. Claims 23-27

The Examiner has rejected claims 23-27 under 35 U.S.C. §103(a) as being unpatentable over Asamizuya in view of U.S. Patent 6,084,636 to Sugahara et al. (hereinafter "Sugahara") and Russo. The applicants have canceled claims 23-27. Therefore, the rejection is considered moot.


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Conclusion

The applicants believe that all of the claims presently in the application are in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Steven M. Hertzberg, Esq. or Eamon J. Wall, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,


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